

Negative Exponents ... another look

Today we will continue our work with negative exponents

... with more challenging problems 😊

1) Simplify the following so that no negative exponents remain in your answer

a) $(12x^{-12}y^7)(-2x^2y^{-3})$

add powers: $-24x^{-10}y^4$ move x's $= \frac{-24y^4}{x^{10}}$

b) $(-5x^{-4}y^6)^{-3}$

new problem ... flip first is easiest

$$\frac{1}{(-5x^{-4}y^6)^3}$$

apply expo $\frac{1}{-125x^{-12}y^{18}}$ move x $= \frac{x^{12}}{-125y^{18}}$

c) $(3x^3y^{-8}z^{-2})^{-4}$

$\frac{1}{(3x^3y^{-8}z^{-2})^4}$ apply expo $\frac{1}{81x^{12}y^{-32}z^{-8}}$ move y,z $= \frac{y^{32}z^8}{81x^{12}}$

c) $\left(\frac{12x^{-3}y^{10}}{96x^2y^{-2}}\right)^{-2}$

choice flip first or simplify inside $\left(\frac{y^{12}}{8x^5}\right)^{-2}$ flip $\left(\frac{8x^5}{y^{12}}\right)^2$ apply expo $= \frac{64x^{10}}{y^{24}}$
 let's simplify x^3 down, y^2 up

d) $(-4x^3)^{-2}(8x^6)^2$

move 1st bracket $\frac{(8x^{-6})^2}{(-4x^3)^2}$ apply expo $\frac{64x^{-12}}{16x^6}$ move x down $= \frac{4}{x^{18}}$

e) $\frac{(x^{7w-3})^2}{(x^{3w-1})^2}$

apply expo to all internal expo $\frac{x^{14w-6}}{x^{6w-2}}$ subtract expo $= x^{8w-4}$

f) $\frac{(12xy^8)^{-2}(-4x^{10}y^{-4})^3}{18x^5y^{-18}}$

move 1st bracket down, apply 2nd expo, move y up $\frac{(-64x^{30}y^{-12})y^{18}}{18x^5(12xy^8)^2}$ simplify $\rightarrow \frac{(-32x^{25}y^6)}{9(144x^2y^{16})}$ simplify = $\frac{-2x^{23}}{81y^{10}}$

Assignment – worksheet

Negative Expo #2

1) Simplify the following so that no negative exponents remain in your answer

a) $(-6x^2y^3)(-x^2y^4)$

b) $(3x^2y^2)(-2x^2y^3)$

c) $\frac{-6x^{-4}y}{12x^{-2}y^6}$

d) $\frac{-54x^5y^{-7}}{6x^{-2}y^{-3}}$

e) $\frac{(-2x^{-3}y)(-12x^{-4}y^{-2})}{6xy^{-3}}$

f) $(5x^{-3}d^3)^{-2}$

g) $(-2x^{-3}b^{-2})^{-3}$

h) $(-3x^3b^{-2})^{-4}$

i) $(-4x^{-6}b^2)^{-3}$

j) $(3x^3y^{-8}z^{-2})^3$

k) $\left(\frac{4x^{-2}y^4}{8x^2y^{-2}}\right)^{-2}$

l) $\frac{(x^{5p-3})^3}{(x^4p)^2}$

m) $\frac{(-2x^{-12}y^{10})^2}{(5x^{10}y^4)^{-3}}$

n) $\left(\frac{-45x^{-8}y^{-10}}{5x^{10}y^8}\right)^{-3}$

o) $\frac{(9xy^6)^{-2}(-5xy^{-4})}{18xy^{-8}}$